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LIGHT MANAGEMENT PLAN

LAUNCH COMPLEX 41 -- FACILITY 29100

CAPE CANAVERAL AIR FORCE STATION

FLORIDA

PREPARED BY

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ENGINEERING SERVICES

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TABLE OF CONTENTS

	Page
ACRONYMS AND ABBREVIATIONS	iii
TABLES	iv
1.0 INTRODUCTION	1
1.1 PURPOSE	1
1.2 OBJECTIVE	2
2.0 DESCRIPTION	3
2.1 LAUNCH PAD, UMBILICAL TOWER, AND MOBILE SERVICE TOWER (FACILITIES 29100B, AND GY)	4
2.2 FUEL, LIQUID OXYGEN, LIQUID HYDROGEN AND OXIDIZER HOLDING AREAS; POL AND GAS STORAGE AREAS (FACILITIES 29100 F, AK, AM, X, T, AL AND V)	4
2.3 COMPLEX 41 SUPPORT/BUILDINGS/FACILITIES	5
3.0 MODIFICATIONS	5
3.1 SECURITY UPGRADE PROJECT	5
3.2 LAUNCH PAD, UMBILICAL TOWER, AND MOBILE SERVICE TOWER	6
3.3 LAUNCH COMPLEX 41 FUEL STORAGE AREAS	6
3.4 LAUNCH COMPLEX 41 SUPPORT BUILDINGS FACILITIES	7
3.5 SUMMARY OF MODIFICATIONS	7
4.0 OPERATIONAL CONSTRAINTS	10
4.1 LAUNCH PAD, UMBILICAL TOWER, AND MOBILE SERVICE TOWER	11
4.2 LAUNCH COMPLEX 41 FUEL STORAGE AREAS	11
4.3 GENERAL CONSTRAINTS	12
5.0 COMPLIANCE VERIFICATION	14
ATTACHMENT 1 LC 41 LIGHTING SURVEY SCHEDULE	A1
ATTACHMENT 2 LC 41 LIGHT SURVEY FIXTURE LOCATIONS	A2

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1 JUNE 2015

ACRONYMS AND ABBREVIATIONS

AFR	Air Force Regulation
CCAFS	Cape Canaveral Air Force Station
DOD	Department of Defense
HPS	High Pressure Sodium (Lighting)
LPS	Low Pressure Sodium (Lighting)
INC	Incandescent (Lighting)
N/A	Not Applicable
OMEL	Operations Manual for Exterior Lighting
POL	Paint, Oil and Lubricants
QTZ	Quartz (Lighting)
USFWS	United States Fish and Wildlife Service
LC-41	Launch Complex 41
UT	Umbilical Tower
MST	Mobile Service Tower
LOX	Liquid Oxygen
MV	Mercury Vapor
MH	Metal Halide

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1 JUNE 2015

TABLES

TABLE 1 - SUMMARY OF LIGHTING CHANGES, LC-41 8

TABLE 2 - SUMMARY OF LIGHT ELIMINATIONS, LC-41 8

TABLE 3 - LIGHTS WHICH WILL BE SHIELDED ON THE LC-41 MOBILE SERVICE TOWER (MST) 8

TABLE 4 - LIGHTS WHICH WILL BE SHIELDED ON THE LC-41 UMBILICAL TOWER (UT) 9

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1 JUNE 2015

LIGHT MANAGEMENT PLAN

1.0 INTRODUCTION

1.1 Purpose:

The purpose of this plan is to provide site specific guidelines for the operation of lights which are known to adversely affect threatened and endangered sea turtle nesting activity on the Cape Canaveral Air Force Station (CCAFS) coastal beach. This action is required to reduce, to the maximum extent practicable, the incidental take of sea turtle hatchlings resulting from disorientation caused by direct and indirect lighting generated from various facilities on CCAFS. Development and implementation of this plan and the attached Lighting Survey Schedule (Attachment 1) are obligatory actions to comply with the recommendations put forth by the U.S. Fish and Wildlife Service (USFWS) during consultation with the Air Force in accordance with Section 7 of the Endangered Species Act of 1973, as amended. The directives described in this Plan will be executed during the annual CCAFS sea turtle nesting season (1 May - 31 October). Sea turtle hatching usually does not occur until late June. Research indicates that artificial lighting adjacent to coastal nesting beaches deters nesting females from approaching the affected section of beach; therefore the initial effective date of the plan was expanded to include early beach selection and nest laying activity. In addition, it is recommended that the directives included in this operational plan be implemented throughout the year to facilitate the Air Force energy conservation program described in AFR 18-1, Air Force Energy Management. Both programs, energy conservation and endangered species protection, are mandated by federal law and all directives, such as this plan, must be adhered to by all CCAFS

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tenants, users and contractors.

1.2 Objective:

The objective of this plan is to reduce light sources that are known to disorient sea turtle hatchlings migrating to the ocean after emerging from the nest. Additionally, preliminary research indicates that lights adjacent to sea turtle nesting beaches, may hinder the beach and nest site selection of nesting females. Therefore, this plan will describe light use methodologies directed toward reducing the adverse impact of facility lighting on nesting and hatchling sea turtles.

The preferred method of reducing direct and indirect light on the beach is to eliminate the light source. In most cases, this cannot be achieved due to safety, security and operational requirements. The attached survey and evaluation was conducted to identify any lights which could be eliminated without adversely affecting these requirements. In addition, research shows that various types of lights affect sea turtles to varying degrees, with low pressure sodium lights (589-590 nanometers) having the least affect on sea turtles. With lights other than low pressure sodium, increased light intensities (lumens or foot candles) increases the potential for hatchling disorientation.

The Lighting Survey Schedule (Attachment 1) makes recommendations for the fate of each light identified at Complex 41.

Fates include the following actions:

1. elimination of the light,
2. replacement of the light type,
3. replacement of multi-light controls and photocells with fixture

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specific switches,

4. installation of a light shield at the fixture,

5. controlled use, and

6. no action.

Changes in existing lights which will require little or no funding will be implemented immediately and more costly modifications or replacements will be programmed to occur within 2 years of the date of approval of the plan. This plan also covers light operation requirements and/or pre-launch situations where use of individual lights are authorized. The plan will serve as a basis for developing an operations manual for exterior lights for building tenants and facility users. Compliance with the guidelines for operation of lights will be a requirement of all DOD and contractor personnel.

2.0 DESCRIPTION

Launch Complex 41 (LC-41) is a single launch pad with approximately 23 support facilities including fuel/oil storage areas; equipment buildings; roadways, and walkways. All of the facilities are equipped with exterior lights which are used for night launch support operations and personnel safety and security. Interviews with representatives from the Air Force and contractor user organizations, safety, and security departments revealed light use in excess of their requirements to support launch operations. In addition, the proposed physical security upgrade projects such as dual perimeter fences with low pressure sodium floodlights and surveillance cameras will further reduce the need for utilizing exterior facility lights for security purposes. Based upon these interviews, a number of exterior lights will be eliminated, changed to high or low pressure sodium fixtures, or replaced with 75 watt yellow incandescent

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'bug' type light bulbs. Further, an operation manual for exterior lights (OMEL) will be written for the complexes which describes lights that are required to support launch operations and their operational constraints. The OMEL will be prepared by facility managers and site personnel.

The following sections will provide a general description of the exterior lights and their locations in the LC-41 area. For the exact location and precise description of each light, refer to Attachment 1, LC-41, Lighting Survey Schedule and Attachment 2, Light Survey Fixture Locations.

2.1 Launch Pad, Umbilical Tower, and Mobile Service Tower (Facilities 29100B, and GY)

The launch pad, umbilical and mobile service towers are currently equipped with 552 lights. The pad has 37 incandescent, mercury vapor, and metal halide pole mounted lights for area lighting. The umbilical tower is equipped with 189 lights. These are approximately 17 high-pressure sodium and two (2)metal halide lights on each of the 13 platforms. A large potion of the east side of the UT and approximately 1/3 of the north and south sides have been covered with a metal siding. This material effectively shields the majority of UT light from the beach. Each of the 19 levels of the mobile service tower contains 17 lights of various types (high pressure sodium and metal halide) and wattages, which provide stairwell and work space lighting. All of the lights on the Launch Pad, MST and UT must have explosion proof fixtures for safety reasons due to the presence of group C&D explosives.

2.2 Fuel, Liquid Oxygen, Liquid Hydrogen and Oxidizer Holding Areas; POL and Gas Storage Areas (Facilities 29100 F, AK, AM, X, T, AL and V)

The Complex 41 fuel, oxidizer, liquid hydrogen, liquid oxygen, POL,

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and gas storage areas have a total of 149 pole or wall mounted high pressure sodium and incandescent light fixtures which provide personnel access and safety lighting. These facilities will be collectively addressed as Complex 41 Fuel Storage Areas in future sections. Explosion proof light fixtures and required at these facilities.

2.3 Complex 41 Support Buildings/Facilities

There are 90 exterior fixtures in various areas throughout Complex 41 which support launch operations. These lights consist of 25 mercury vapor lights, one quartz light, 37 high pressure sodium and 27 incandescent lights of various wattages. The lights are located in the launch complex area and provide personnel access and safety lighting.

3.0 MODIFICATIONS

Due to the large number (23) of individual buildings, structures, walkways, parking lots and storage areas within the Complex 41 area, individual light modifications to each facility will not be described in this section. Specific information concerning each light is provided in Attachment 1, Lighting Survey Schedule. Additionally, the lighting survey schedule provides cost estimates for light modifications and time frames for completion of the modifications based upon approval of this plan and it's effective date.

3.1 Security Upgrade Project

A project to upgrade physical security at LC-41 has been designed and construction is expected to begin in FY-90. This project will include the installation of 57 low pressure sodium floodlights around the perimeter of the complex to provide lighting for surveillance cameras. This action will result in the elimination of 35 incandescent, 13 mercury vapor and one high

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pressure sodium floodlight currently in operation throughout the complex.

3.2 Launch Pad, Umbilical Tower, and Mobile Service Tower

For the purposes of this plan, the pad includes the mobile service tower (MST) and umbilical tower (UT) lights. All the lights on the MST and UT are explosion-proof fixtures fitted with high pressure sodium, metal halide, mercury vapor, and incandescent light bulbs. Explosion-proof fixtures are a safety requirement for facilities such as this and modifications are limited based on this stipulation. The use of MST and UT lights will be controlled based on user need and security requirements. In addition, light shields will be installed on light fixtures from Level 4 on up, which may be visible from the adjacent beach. This action will be described further in Section 4, Operational Constraints.

On the pad, 3-incandescent lights will be replaced with high pressure sodium, and the remaining 3 pad lights changed to low pressure sodium and high pressure sodium fixtures. The umbilical tower and mobile service tower will be addressed in the Operational Constraints Section of this plan. In addition, light shields will be provided on a number of lights on the mobile service tower, and umbilical tower, as described in the Lighting Survey Schedule. Approximately 240 UT and MST lights will be shielded.

3.3 Launch Complex 41 Fuel Storage Areas

The fuel, oxidizer, liquid hydrogen holding areas and gas storage areas located at the launch complex are equipped with 114 high pressure sodium, 2 quartz and 33 incandescent lights for work area illumination and safety. Explosion proof light fixtures are required in all fuel storage areas. Fifteen quartz and incandescent lights will be changed to high pressure sodium fixtures. These facilities are used only one or two nights

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per launch, therefore, they will be controlled by restricted use operational constraints. In addition, the LC 41 storage areas (Facilities #29100 AK,AL and X) will have one high pressure sodium and three incandescent lights eliminated. No shielding will be installed since none of these lights are directly visible from the adjacent coastal beach.

3.4 Launch Complex 41 Support Buildings/Facilities

Thirty-three launch complex lights; 13 pole-mounted mercury vapor; and 20 incandescent lights will be eliminated. Further, twelve mercury vapor street lights will be replaced with low pressure sodium fixtures.

The remaining 13 complex support buildings are equipped with 65 lights of various types and wattages. There are 29 incandescent lights that will be replaced with 75 watt yellow bug lights. Five incandescent lights on various buildings will be replaced with low pressure sodium fixtures. The Substation Facility has 6-150 watt incandescent lights which will be replaced with high pressure sodium lights.

3.5 Summary of Modifications

Table 1, Summary of Lighting Changes, and Table 2, Summary of Lighting Eliminations, LC-41, Table 3, Lights Which Will Be Shielded On The LC-41 Mobile Service Tower (MST), and Table 4, Lights Which Will Be Shielded On The LC-41 Umbilical Tower (UT), provide a compendium of the above information.

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TABLE 1

SUMMARY OF LIGHTING CHANGES, LC-41

Quantity	Description	Change To
26	400 watt - MV	LPS
3	400 watt - MV	HPS
14	400 watt - MH	LPS
2	QUARTZ	HPS
241	HPS	Light Shield
11	150 watt - INC	HPS
5	150 watt - INC	HPS/Explosion Proof
30	150 watt - INC	Bug Light
6	150 watt - INC	HPS
3	1,000 watt - INC	LPS
2	1,500 watt - INC	LPS
343 Total		

TABLE 2

SUMMARY OF LIGHT ELIMINATIONS, LC-41

Quantity	Description
13	400 watt MV
35	Incandescent
1	HPS
49 Total	

****

TABLE 3

LIGHTS WHICH WILL BE SHIELDED ON THE LC-41 MOBILE SERVICE TOWER (MST)

Level #	Light ID #	Total # of Shields
4	68, 69, 70, 71, 72, 73, 66, 74, 75	9
5	77, 78, 79, 81, 82, 83, 84, 85, 86, 87, 88	11
6	90, 91, 92, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103	13
7	105, 106, 107, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118	13

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8	120, 121, 122, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133	13
9	135, 136, 137, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150	15
10	152, 153, 154, 156, 157, 158, 159, 160, 161, 162, 163, 164	12
11	166, 167, 168, 170, 161, 172, 173, 174, 175	9
12	177, 178, 179, 181, 182, 183, 184, 185, 186, 187, 188, 189	12
13	191, 192, 193, 195, 196, 197, 198, 199, 200, 201, 202, 203	12
14	205, 206, 207, 208, 213, 214, 215, 216, 218, 221, 223	11
15	229, 233, 234, 235, 236, 237, 239, 240, 241, 242, 243, 244	12
16	247, 248, 249, 250, 253, 254, 255, 257, 258, 259, 262, 268	12
17	269, 270, 271, 274, 275, 277	6
18	280, 281, 282, 283, 286, 287, 288, 289	8
19	296, 298, 299, 301, 302, 303	6
EL 320'	310, 311, 314, 314, 316, 317, 318	7
	TOTAL	181

****

TABLE 4

LIGHTS WHICH WILL BE SHIELDED ON THE LC-41 UMBILICAL TOWER (UT)

Level #	Light ID #	Total # of Shields
4	53, 54, 59, 60, 61	5
5	66, 67, 71, 73, 74	5

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6	79, 80, 84, 86, 87	5
7	92, 93, 97, 99, 100	5
8	104, 105, 109, 111, 112	5
9	116, 117, 121, 123, 124	5
10	128, 129, 133, 135, 136	5
11	140, 141, 145, 147, 148	5
12	152, 153, 157, 159, 160	5
13	164, 165, 169, 171, 172	5
EL. 260'	176, 177, 179, 180, 182, 183	6
EL. 270'	184, 185, 188, 189	4
	TOTAL	60

4.0 OPERATIONAL CONSTRAINTS

This section will provide guidelines for the controlled operation of exterior lights at LC-41. This information is based upon the findings of the lighting survey and interviews conducted with representatives of all agencies utilizing exterior lights at the complex. Facility user personnel will be required to switch off lights upon completion of the task requiring their use and/or completion of the last work shift occurring at night. Specific user personnel responsibilities will be identified in an Operations Manual for Exterior Lighting (OMEL). The OMEL will be developed by facility management personnel. All responsible facility managers, shift supervisors, building custodians and personnel utilizing or working in the area of exterior lights will be required to read, sign and implement the OMEL.

The following information provides general operational constraints to be implemented upon approval of this plan and will remain in effect until a site specific OMEL can be developed and implemented.

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4.1 Launch Pad, Umbilical Tower and Mobile Service Tower Facilities

Use of exterior lights on the launch pad, and all lights on the Mobile Service Tower or (MST) and umbilical tower (UT) will be prohibited unless a missile is on the pad. The only exception would be if emergency repairs or modifications are needed which require night shift work or for security.

When night work is needed on a missile while at the pad, only the work levels required and the paths of ingress/egress will be lighted. These lights will be extinguished by user personnel immediately upon completion of their task. Each level and the stairwells and elevator of the MST and UT will be on separate switches to facilitate area and need specific lighting.

In addition, a security guard will be posted at the pad when a missile is present. New security requirements mandate periodic inspections to be conducted which will require lighting. The stairwell will be lighted throughout the security inspection procedure with individual levels being lighted for the physical inspection of that level. The lights on each level will be extinguished immediately upon completion of the inspection of that level unless Air Force contractor personnel are working simultaneously to the security inspection.

4.2 Launch Complex 41 Fuel Storage Areas

Based on interviews with Air Force and Contractor personnel for the attached survey, these storage facilities are utilized approximately 2-3 days per launch unless delays in the launch schedule necessitate additional use. It has been determined that the controlled use of lights at these areas, restricted to an "as needed" basis, will be sufficient to ensure

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minimal or no adverse affects resulting from these lights. Therefore, lights will only be utilized when personnel are on-site during fueling or repair operations. The users will extinguish all storage area lights immediately upon completion of fueling operations. Both color differentiation and explosion proof light fixtures are a requirement at these facilities, which precludes the use of LPS lighting.

4.3 General Constraints

Research shows that the most effective method of reducing the adverse effect to sea turtles from artificial light is to remove the source. In most cases, the lights currently existing on buildings and structures at LC-41 are periodically required for night work in support of a launch, security visibility and personnel safety. Each light at LC-41 has been evaluated based on information provided by user organization representatives to ascertain the feasibility of removing excessive light fixtures For lights which cannot be eliminated, the second most effective alternative is the controlled use of the light; restricting light use to an "as needed" basis.

Therefore, the following general constraints will be implemented upon approval of this plan.

- Personnel access door and step/stair lights will be turned on only for those areas which will be utilized during a designated night shift. These lights will be extinguished by shift personnel working in the area upon completion of the shift. Shift supervisors will inspect work areas to ensure compliance.
- Electrical substations, outdoor equipment and open storage area lights will be used only when night activities or inspections require the area to be lighted. Personnel working in these areas

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will be required to switch off light(s) upon completion of their task.

- None of the lights identified in Attachment 1, LC-41 Lighting Survey Schedule, will be left on continuously for security purposes. (A security upgrade project is currently underway to install a dual perimeter fence with LPS floodlighting for surveillance cameras to protect vital complex components. In addition, area floodlighting inside the interior boundary fence will be provided. This system will illuminate facilities within specific zones utilizing quartz floodlights activated from the security entry control building. The quartz area lighting will only be utilized in the event of an intrusion into the facility, or for infrequent reliability testing.

  This action will preclude the need to continually light LC-41 facilities for security surveillance purposes.) Security lighting use requirements will be addressed in the operational instructions for the new security system and complex security requirements.
- Any exterior lights turned on by security personnel will be switched off immediately upon completion of their requirement for that light.

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5.0 COMPLIANCE VERIFICATION

Building custodians and the managers of the facility user organization(s) will be ultimately responsible to ensure compliance of these procedures by site personnel. The following monitoring and enforcement actions will be taken, and the person(s) responsible for the misuse of lights will be notified.

- The Air Force will issue annual notices to all complex personnel prior to sea turtle nesting season reminding tenants of light use requirements and responsibilities.
- Launch Base Support (LBS) Contractor, Environmental Engineering personnel will conduct unannounced evening inspections of Complex 41 to ensure compliance with the plan and the OMEL. Further, the U. S. Fish and Wildlife Service will be conducting on-site inspections coordinated through the 6550th ABG/DEEV to verify compliance and make recommendations for changes or revisions in this plan and/or the OMEL. Revisions to this plan will be made as needed or required to further reduce the incidental take of threatened or endangered sea turtle hatchlings on the CCAFS coastal beach.
- The LBS Security Department will designate on officer to conduct periodic nightly inspections throughout CCAFS to ensure compliance with the various LMP's. Inspections will be conducted from 2100 hours to 0500 hours, nightly, starting 1 May and concluding with the hatch of the last nest deposited in the affected areas of beach.
- The LBS Contractor will designate one individual to monitor sea turtle hatchling disorientation throughout the annual nesting season. Duties will include:

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A. Identification of disorientation incidents,

B. Identification of the source of disorientation,

C. Notification of facility tenant, site manager, user agency,

D. Determination of LMP non-compliance,

E. Identification of new, existing, additional, previously undetected and continual sources of disorientation,

F. Initiate action to eliminate sources of disorientation,

G. Erect light screens at all nests in areas where the potential for hatchling disorientation,

H. Maintain accurate records of all activities for periodic reporting and prepare and submit all reports required by the Florida Department of Natural Resources.

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ATTACHMENT 1

LC-41, LIGHTING SURVEY SCHEDULE

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ATTACHMENT 2

LC-41, LIGHT SURVEY FIXTURE LOCATIONS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Pad Area Lighting -- 49100

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-8	North of Pad Pole Mounted	Pad Access/Safety	MH 400 watt Flood	LPS	NTP + 54 weeks	3,500
9-20	North of Pad Pole Mounted	Pad Access/Safety	MV Flood	LPS	NTP + 54 weeks	5,200
21-23	North of Pad Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
24-25	South of Pad Pole Mounted	Work Area/Safety	MH 400 watt Flood	Remove Photocell/ Add Switch and LPS	NTP + 27 weeks Switch. NTP + 81 weeks - LPS	1,200
26-27	South of Pad Pole Mounted	Pad Access/Safety	MH 400 watt Flood	LPS	NTP + 54 weeks	1,400
28-29	South of Pad Pole Mounted	Pad Access/Safety	MV Flood	LPS	NTP + 54 weeks	1,400
30-31	South of Pad Pole Mounted	Work Area/Safety	MV Flood	Remove Photocell/ Add Switch and LPS	NTP + 27 weeks Switch. NTP + 81 weeks - LPS	680
32-33	South of Pad Pole Mounted	Work Area/Safety	MH Flood	Remove Photocell/ Add Switch and LPS	NTP + 27 weeks Switch. NTP + 81 weeks - LPS	680
34	South of Pad Pole Mounted	Work Area/Safety	MV Flood	Remove Photocell/ Add Switch and LPS	NTP + 27 weeks Switch. NTP + 81 weeks - LPS	340
35-37	South of Pad Pole Mounted	Work Area/Safety	INC Flood	LPS	NTP + 81 weeks	1,100

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LIGHTING SURVEY SCHEDULE
ATTA HMENT 1

FACILITY: Launch Complex 41 Generator Pad -- 29100

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Pole Mounted	Work Area/Safety Obsolete (TYP.)	INC Flood	Eliminate	NTP + 27 weeks	N/A
2	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
3	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
4-5	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
6	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
7	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
8	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
9-11	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
12-13	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
14	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
15	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
16	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A

T= 16 E = 16

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Generator -- 29100

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
17-18	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
19-20	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A

4. E = 4

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41. Street Lighting - 29100

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Pole Mounted	Roadway	MV 400 watt (typ)	Eliminate	NTP + 27 weeks	N/A
2	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800
3	Pole Mounted	Roadway and Area	MV	Eliminate	NTP + 27 weeks	N/A
4	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800
5	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
6	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800
7	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
8	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
9	Pole Mounted	Roadway	MV	LPS	NTP + 54 weeks	800
10	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
11	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800
12	Pole Mounted	Roadway and Area	MV	Eliminate	NTP + 54 weeks	N/A

12 E= 7 MV- LPS = 5

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FACILITY: Launch Complex 41, Street Lighting - 29100

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
13	Pole Mounted	Roadway and Area	MV	Eliminate	54 weeks	N/A
14	Pole Mounted	Roadway	MV	LPS	NTP + 54 weeks	800
15	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
16	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
17	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800
18	Pole Mounted	Roadway	MV	LPS	NTP + 54 weeks	800
19	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
20	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
21	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800
22	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800
23	Pole Mounted	Roadway	MV	Eliminate	NTP + 27 weeks	N/A
24	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800
25	Pole Mounted	Roadway and Area	MV	LPS	NTP + 54 weeks	800

= 13 E = 6 MV - LPS = 7

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Air Conditioning Shelter -- 29100D

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-4	Pole Mounted West of AC Shelter	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
5-37	(Enclosed) Suspended From Ceiling	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A

T = 37 ? HPS - LPS

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FACILITY: Launch Complex 41 Protective Coating Building 29100E

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-2	Entrance	Access/Safety	INC 200 watt	Bug Light	NTP + 27 weeks	N/A
3	Wall Mounted	Safety Shower/Safety	INC 200 watt	Bug Light	NTP + 27 weeks	N/A
4-5	Entrance	Access/Safety	INC 200 watt	Bug Light	NTP + 27 weeks	N/A

T = 5

200 INC - 75 BL = 5

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Fuel Holding Area -- 29100F

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-9	Storage Tank/Wall Mounted	Access and Work Area/ Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
10-14	Catwalk	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
15	Stairway	Access/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
16	Catwalk	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
17	Suspended From Roof	Emergency Egress/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
18	Catwalk	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
19-26	Suspended From Roof	Work Area (Control Panel)/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
27-32	Catwalk	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
33	Catwalk	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
34	Suspended From Roof	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
35-36	Stairway	Access/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
37	Catwalk	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Fuel Holding Area -- 29100F

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
38	Catwalk	Emergency Egress/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
39	Suspended From Roof	Work Area and Access/ Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
40-42	Stairway	Access/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
43-49	Catwalk	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
50	Catwalk	Work Area/Safety	HPS 70 watt Flood	Operational Constraints	NTP + 27 weeks	N/A
51-52	Pole Mounted	Work Area/Safety	HPS 70 watt Flood	Operational Constraints	NTP + 27 weeks	N/A

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Sewage Treatment Plan 29100H

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Pole Mounted	Work Area/Safety	QTZ	Operational Constraints	NTP + 27 weeks	N/A

T-1 R QTZ - LPS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Refrigeration Building -- 29100K

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A
2-3	Roofline	Work Area/Safety	INC 200 watt Flood	HPS	NTP + 81 weeks	750

T = 3 150 INC - BL 200 INC - HPS R LAS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Fan House No. 2 -- 29100L

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A

=1 150 INC - BL R = 1 PS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Complex Support Building -- 29100M

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-3	Stairway	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A
4-6	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A

F-6 150 INC - BL P = LPS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Sentry House East -- 29100N

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Roofline	Badge Identification/ Security	INC 150 watt flood	Eliminate	54 weeks	N/A
2	Roofline	Badge Identification/ Security	INC 150 watt flood	Eliminate	54 weeks	N/A

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Storage Building -- 29100P

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Wall Mounted	Obsolete	INC	Eliminate	NTP + 27 wseeks	N/A
2	Wall Mounted	Obsolete	INC	Eliminate	NTP + 27 weeks	N/A
3	Wall Mounted Obsolete	INC	INC	Eliminate	NTP + 27 weeks	N/A

T=3 E=3

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LIGHTING SURVEY SCHEDULE
ATTACHMENT I

FACILITY: Launch Complex 41 Supply and Issue Shop -- 29100Q

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-2	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A
3-4	Roofline	Parking and Area	INC 1500 watt flood	LPS	NTP + 54 weeks	1,600
5-7	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A

=7 150 INC - BL = 5 1500 INC - LPS = 2

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Ready Building -- 29100R

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-4	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A
5	Roofline	Parking and Area	INC 1000 watt Flood	Eliminate	NTP + 27 weeks	N/A
6	Roofline	Parking and Area	INC 1000 watt Flood	LPS	NTP + 81 weeks	800
7-8	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A
9	Roofline	Parking and Area	INC 1000 watt Flood	LPS	NTP + 81 weeks	800
10	Roofline	Parking and Area	INC 1000 watt Flood	Eliminate	NTP + 27 weeks	N/A
11	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A
12	Roofline	Parking and Area	INC 1000 watt Flood	Eliminate	NTP + 27 weeks	N/A
13	Roofline	Parking and Area	INC 1000 watt Flood	LPS	NTP + 81 weeks	800
14	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 29 weeks	N/A

T=14 E=3 150 INC - BL - 8 1000 INC - LPS = 3 R = LPS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Petroleum, Oil, Lube Building -- 29100T

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A

T=1 150 INC - 75 BL

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Emergency Power Shelter -- 29100U

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A

150 INC - LPS = 1

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Gas Storage Area -- 29100V

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Wall Mounted	Work Area/Access	INC 150 watt	Operational Constraints	NTP + 27 weeks	N/A

(R) 150 INC - HPS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Oxidizer Holding Area - 29100X

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-12	Wall Mounted	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
13	Wall Mounted	Emergency Egress/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
14	Wall Mounted	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
15	Stairway	Access/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
16-18	Valve Pit Area	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
19	Suspended from Roof	Emergency Egress/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
20	Suspended from Roof	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
21	Suspended from Roof	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
22	Suspended from Roof	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
23	Suspended from Roof	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
24	Catwalk	Safety Shower/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
25-26	Catwalk	Access and Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A

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LIGHTING SURVEY SCHEDULE
ATTACHMENT I

FACILITY: Launch Complex 41, Oxidizer Holding Area - 29100X

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
27	Catwalk	Access and Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
28-29	Catwalk	Access and Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
30	Catwalk	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
31-32	Catwalk	Access and Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
33	Catwalk	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
34	Suspended from Roof	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
35	Catwalk	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
36	Suspended from Roof	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
37-38	Catwalk	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
39	Catwalk	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
40	Catwalk	Access and Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
41	Catwalk/Stairway	Access/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Oxidizer Holding Area - 29100X

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
42	Catwalk	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
43	Catwalk	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
44	Catwalk	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
45	Catwalk	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
46	Catwalk	Safety Shower/ Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
47	Catwalk	Access and Work Area Shower/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
48-55	Suspended From Roof	Work Area (Control Panel)/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
56-58	Catwalk	Access and Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
59-63	Wall Mounted	Work Area/Safety	INC 150 watt	Operational Constraints/HPS Explosion Proof	NTP + 27 weeks Operational Constraints NTP + 81 weeks HPS	2,700
64	Pole Mounted	Work Area/Safety	HPS 50 watt	Operational Constraints	NTP + 27 weeks	N/A
65-66	Pole Mounted	Oxidizer Scrubber Work Area/Safety	HPS 70 watt Flood	Operational Constraints	NTP + 27 weeks	N/A
67	Catwalk	Area Lighting	HPS 70 watt Flood	Eliminate	NTP + 27 weeks	N/A

T=67 E=1 INC-HPS = 5

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Guard House South -- 29100AB

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Roofline	Security (Badge Check)/ Security	INC 150 watt Flood	Eliminate	54 weeks	N/A

T=1 E=1

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Fan House No. 1 -- 29100AC

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A

T=1 150 INC - BL R = LPS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 GOAS Building -- 29100AH

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-2	Entrance	Access/Safety	INC 150 watt	Bug Light	NTP + 27 weeks	N/A

150 INC - BL = 2

-2

R = LPS

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Liquid Oxygen Holding Area -- 29100 AK

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-3	Pole Mounted	Work Area/Safety	INC Flood	HPS	NTP + 81 weeks	1,100
4-5	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 27 weeks	N/A
6-8	Pole Mounted	Work Area/Safety	INC Flood	HPS	NTP + 81 weeks	1,100
9-18	Wall Mounted	Work Area/Safety	INC 200 watt	Operational Constraints	NTP + 27 weeks	N/A

T = 18 E = 2 R = INC - HPS ?? INC - HPS = 6
10.?

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Gas Storage Area -- 29100AL

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Wall Mounted	Work Area/Safety	INC Flood	HPS	NTP + 81 weeks	450
2	Pole Mounted	Work Area/Safety	INC Flood	Eliminate	NTP + 81 weeks	N/A
3	Pole Mounted	Work Area/Safety	INC Flood	HPS	NTP + 81 weeks	450

T = 3 R = 1 INC - HPS = 2 FSA *

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Liquid Hydrogen Holding Area -- 29100 AM

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-4	Wall Mounted	Work Area/Safety	INC 150 watt	Operational Constraints	NTP + 27 weeks	N/A
5.	Panel Box	Work Area/Safety	INC 150 watt	Operational Constraints	NTP + 27 weeks	N/A
6-7	Pole Mounted	Work Area/Safety	QTZ Flood	HPS	NTP + 81 weeks	550

QTZ - HPS = 2 R = 5INC - HPS

T=7

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Substation -- 29100 AN

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-6	Pole Mounted	Work Area/Safety	INC 150 watt	HPS	NTP + 81 weeks	500

NEED COLORS

-=6 150 INC - HPS = 6 R - SWITCH [illegible] ON FOR NIGHT OPS ONLY (MAYBE 1 AREA UPS)

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower -- 29100GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1-4	Base Level	Work Area/Safety	HPS 70 watt (TYP.)	Operational Constraints	NTP + 27 weeks	N/A
5-6	Base Level	Emergency Egress/Safety	HPS 100 watt (TYP.)	Operational Constraints	NTP + 27 weeks	N/A
7-9	Base Level	Work Area/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
10	Base Level	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
11-12	Base Level Stairway	Access/Safety	HPS 70 watt (TYP)	Operational Constraints	NTP + 27 weeks	N/A
13-15	Platform No. 1	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
16	Platform No. 1, Stairway	Access/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
17-26	Platform No. 1	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
27-28	Platform No. 1	Missile Floodlighting	HPS 70 watt (TYP.)	Operational Constraints	NTP + 27 weeks	N/A
29-32	Platform No. 2	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
33	Platform No. 2, Stairway	Access/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
34-36	Platform No. 2	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower -- 29100GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
37	Platform No. 2	Missile Floodlighting	HPS	Operational Constraints	NTP + 27 weeks	N/A
38-43	Platform No. 2	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
44-47	Platform No. 3	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
48	Platform No. 3, Stairway	Access/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
49	Platform No. 3	Work Area Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
50-51	Platform No. 3	Missile Floodlighting	HPS	Operational Constraints	NTP + 27 weeks	N/A
52-57	Platform No. 3	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
58-65	Platform No. 3, Exterior	Pad Area/Safety	MH 250 watt	HPS	NTP + 81 weeks	
64a	Platform No. 4	Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
65a	Platform No. 4	Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
66	Platform No. 4	Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
67	Platform No. 4	Emergency Egress/Safety		Operational Constraints	NTP + 27 weeks	N/A

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower -- 29100GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
68	Platform No. 4, Stairway	Access/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
69-75	Platform No. 4	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
76	Platform No. 4	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
77-79	Platform No. 5	Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
80	Platform No. 5	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
81	Platform No. 5, Stairway	Access/Sfety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
82-88	Platform No. 5	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
89	Platform No. 5	Work Area/Safety	HPS	Operational Constraints/	NTP + 27 weeks	N/A
90-92	Platform No. 6	Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	160
93	Platform No. 6	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
94	Platform No. 6, Stairway	Access/Safety	HPS	Operational Constraints Shield	NTP + 27 weeks	N/A
95	Platform No. 6	Work Area/Safety	HPS	Operational Constraints Shield	NTP + 27 weeks	N/A

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LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower - 2900GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
96-97	Platform No. 6	Missile Floodlighting	HPS	Operational Constraints Shield	NTP + 27 weeks	N/A
98-103	Platform No. 6	Work Area/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	280
104	Platform No. 6	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
105-107	Platform No. 7	Emergency Egress/Safety	HPS	Operational Constraints Light Shield	NTP + 27 weeks	160
108	Platform No. 7	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
109	Platform No. 7, Stairway	Access/Safety	HPS	Operational Constraints Shield	NTP + 27 weeks	N/A
110	Platform No. 7	Work Area/Safety	HPS	Operational Constraints Shield	NTP + 27 weeks	N/A
111-112	Platform No. 7	Missile Floodlighting	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
113-118	Platform No. 7	Work Area/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	280
119	Platform No. 7	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
120-122	Platform No. 8	Emergency Egress/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	160
123	Platform No. 8	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A

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1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower -- 29100GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
124	Platform No. 8, Stairway	Access/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
125	Platform No. 8	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
126-127	Platform No. 8	Missile Floodlighting	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
128-133	Platform No. 8	Work Area/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	280
134	Platform No. 8	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
135-137	Platform No. 9	Emergency Egress/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	160
138	Platform No. 9	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
139	Platform No. 9	Access/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
140-142	Platform No. 9	Work Area/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	80
143-144	Platform No. 9	Missile Floodlighting	HPS	Operational Constraints Shield	NTP + 27 weeks	N/A
145-150	Platform No. 9	Work Area/Safety	HPS	Operational Constraints Light Shield	NTP + 27 weeks	280
151	Platform No. 9	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower -- 29100GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
177-179	Platform No. 12	Emergency Egress/Safety	HPS	Operational Constraints / Light Shield	NTP + 27 weeks	160
180	Platform No. 12	Emergency Egress/Safety	HPS	Operational Constraints/	NTP + 27 weeks	N/A
181	Platform No. 12, Stairway	Access/Safety	HPS	Operational Constraints Shield	NTP + 27 weeks	N/A
182-189	Platform No. 12	Work Area/Safety	HPS	Operational Constraints Light Shield	NTP + 27 weeks	120
190	Platform No. 12	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
191-193	Platform No. 13	Emergency Egress/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	160
194	Platform No. 13	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
195-197	Platform No. 13	Work Area Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	80
198	Platform No. 13, Stairway	Access/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
199-203	Platform No. 13	Work Area Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	160
204	Platform No. 13	Work Area Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
205-208	Platform No. 14	Emergency Egress/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	160

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower -- 29100GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
245	Platform No. 15	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
246	Platform No. 16	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
247-250	Platform No. 16	Emergency Egress/Safety	HPS	Operational Constraints Light Shield	NTP + 27 weeks	120
251	Platform No. 16	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
252	Platform No. 16, Stairway	Access/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
253	Platform No. 16,	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
254-259	Platform No. 16	Work Area/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	400
260-261	Platform No. 16	Work Area/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
262	Platform No. 16	Work Area/Safety	HPS 100 watt	Operational Constraints Shield	NTP + 27 weeks	N/A
263-267	Platform No. 16	Work Area/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
268	Platform No. 16	Work Area/Safety	HPS 100 watt	Operational Constraints/ Shield	NTP + 27 weeks	N/A
269-271	Platform No. 17	Emergency Egress/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	40

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower -- 29100GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
272-273	Platform No. 17	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	40
274-275	Platform No. 17, Stairway	Access/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
276	Platform No. 17	Access/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
277	Platform No. 17	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	120
278-279	Platform No. 17	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	40
280-283	Platform No. 18	Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
284-285	Platform No. 18	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
286-289	Platform No. 18, Stairway	Access/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	120
290-295	Platform No. 18	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
296	Platform No. 19	Emergency Egress/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	N/A
297	Platform No. 19	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
298-299	Platform No. 19	Emergency Egress/Safety	HPS	Operational Constraints/ Light Shield	NTP + 27 weeks	80

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41 Mobile Service Tower -- 29100GY

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
300	Platform No. 19	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
301-303	Platform No. 19, Stairway	Access/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
304-308	Platform No. 19	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	240
309	Platform No. 19	Work Area/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
310-311	Elevation 320'	Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
312	Elevation 320'	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
313	Elevation 320'	Work Area/Safety	HPS 100 watt	Operational Constraints/	NTP + 27 weeks	N/A
314-318	Elevation 320'	Work Area/Safety	HPS 100 watt	Operational Constraints/ Shield	NTP + 27 weeks	N/A
319-320	Elevation 320'	Work Area/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
321-326	Elevation 320'	Work Area (Crane)/ Safety	MH 100 watt	Operational Constraints	NTP + 27 weeks	N/A

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Umbilical Tower - 29100B

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
1	Base Level/Stairway	Access/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
2-5	Base Level	Work Area/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
6	Base Level	Emergency Egress/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
7-10	Base Level	Work Area/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
11	Elev. 115, Stairway	Access and Emergency Egress/Safety	HPS 70 watt	Operational Constraints	NTP + 27 weeks	N/A
12-13	Elev. 115	Work Area/Safety	HPS 100 watt	Operational Constraints	NTP + 27 weeks	N/A
14-15	Platform No. 1, Stairway	Access and Emergency Egress/Safety	HPS 70 watt (TYP.)	Operational Constraints	NTP + 27 weeks	N/A
16-19	Platform No. 1	Work Area/Safety	HPS 100 watt (TYP.)	Operational Constraints	NTP + 27 weeks	N/A
20	Platform No. 1	Emergency Egress/ Safety	HPS 70 watt (TYP.)	Operational Constraints	NTP + 27 weeks	N/A
21-23	Platform No. 1	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
24-26	Platform No. 1 Exterior	Missile Floodlighting	MH 250 watt (TYP.)	Operational Constraints	NTP + 27 weeks	N/A
27-28	Platform No. 2, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A

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1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Umbilical Tower - 29100B

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
29-32	Platform No. 2	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
33	Platform No. 2	Emergency Egress/ Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
34-36	Platform No. 2	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
37-39	Platform No. 2, Exterior	Missile Floodlighting	HPS	Operational Constraints	NTP + 27 weeks	N/A
40-41	Platform No. 3, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
42-45	Platform No. 3	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
46	Platform No. 3	Emergency Egress/ Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
47-49	Platform No. 3	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
50-52	Platform No. 3, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
53-54	Platforn No. 4, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
55-57	Platform No. 4	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
58	Platform No. 4	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Umbilical Tower - 29100B

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
59-61	Platform No. 4	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
62	Platform No. 4	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
63-65	Platform No. 4, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
66-67	Platform No. 5, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
68-70	Platform No. 5	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
71	Platform No. 5	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
72	Platform No. 5	Emergency Egress	HPS	Operational Constraints	NTP + 27 weeks	N/A
73-74	Platform No. 5	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
75	Platform No. 5	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
76-78	Platform No. 5, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
79-80	Platform No. 6, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
81-83	Platform No. 6	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Umbilical Tower - 29100B

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
84	Platform No. 6	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
85	Platforn No. 6	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
86-87	Platform No. 6	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
88	Platform No. 6	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
89-91	Platform No. 6, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
92-93	Platform No. 7, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
94-96	Platform No. 7	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
97	Platform No. 7	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
98	Platform No. 7	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
99-100	Platform No. 7	Work Area/Safety	HPS	Operational Constraints/	NTP + 27 weeks	N/A
101	Platform No. 7	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
102-103	Platform No. 7, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Umbilical Tower - 29100B

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
104-105	Platform No. 8, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
106-108	Platform No. 8	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
109	Platform No. 8	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
110	Platform No. 8	Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
111-112	Platform No. 8	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
113	Platform No. 8	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
114-115	Platforn No. 8, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
116-117	Platform No. 9, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
118-120	Platform No. 9	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
121	Platform No. 9	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
122	Platform No. 9	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
123-124	Platform No. 9	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

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LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
125	Platform No. 9	Work Area/Safety	HPS	Operational Constraints/	NTP + 27 weeks	N/A
126-127	Platform No. 9, Exerior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
128-129	Platform No. 10, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
130-132	Platform No. 10	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
133	Platform No. 10	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
134	Platform No. 10	Emergency Egress Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
135-136	Platform No. 10	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
137	Platform No. 10	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
138-139	Platform No. 10, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
140-141	Platform No. 11, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
142-144	Platforn No. 11	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
145	Platform No. 11	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A

NRO APPROVED FOR RELEASE
1 JUNE 2015

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

FACILITY: Launch Complex 41, Umbilical Tower - 29100B

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
146	Platform No. 11	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
147-148	Platform No. 11	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
149	Platform No. 11	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
150-151	Platform No. 11, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
152-153	Platform No. 12, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints Shield	NTP + 27 weeks	N/A
154-156	Platform No. 12	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
157	Platform No. 12	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
158	Platform No. 12	Emergency Egress/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
159-160	Platform No. 12	Work Area/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A
161	Platform No. 12	Work Area/Safety	HPS	Operational Constraints	NTP + 27 weeks	N/A
162-163	Platform No. 12, Exterior	Missile Floodlighting	MH	Operational Constraints	NTP + 27 weeks	N/A
164-165	Platform No. 13, Stairway	Access and Emergency Egress/Safety	HPS	Operational Constraints/ Shield	NTP + 27 weeks	N/A

LIGHTING SURVEY SCHEDULE
ATTACHMENT 1

NRO APPROVED FOR RELEASE
1 JUNE 2015

FACILITY: Launch Complex 41, Umbilical Tower - 29100B

LIGHT ID NO's	LOCATION	PURPOSE/ REQUIREMENT	LIGHT TYPE/ WATTAGE	RECOMMENDED ACTION	IMPLEMENTATION DATE	ESTIMATED COST
186-187	Elevation 270'	Work Area and Emergency Egress/Safety	HPS - 70 watt	Operational Constraints	NTP + 27 weeks	N/A
188-189	Elevation 270'	Work Area and Emergency Egress/Safety	HPS - 70 watt	Operational Constraints Shield	NTP + 27 weeks	N/A